

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-328134

(43)Date of publication of application : 15.12.1998

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(51)Int.Cl. A61B 1/00

A61B 1/00

A61B 1/12

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#### (54) BRUSH INSERTING AUXILIARY IMPLEMENT FOR ENDOSCOPE

##### (57)Abstract:

PROBLEM TO BE SOLVED: To attach a brush to a cylindrical body without an error by providing a piston body and the cylindrical body to attach thereto with an index displaying that the bodies makes a pair and providing a brush inserting auxiliary tool an index making a pair with the index of the cylinder body.

SOLUTION: The color of a colored index 38 surrounding the tip face of the cylindrical body 21 and the color of the colored cylinder of an operation button are made blue, e.g. and the color of a colored index 58 surrounding the tip face of the cylindrical body 41 and the color of the colored axis body of an operation button are made red, e.g. A cleaning brush 100 is inserted from a brush guiding hole 66 to guide the brush 100 into a connecting pipe 9 to brush-clean inside of the pipe 9. Then, the engage-in part 61 of the brush inserting auxiliary tool 60 is constituted of plastic in blue, e.g. being the same color as the index 38 of an air/water sending switch operation valve 20. On the other hand, the brush inserting auxiliary tool for an absorbing operation valve 40 is constituted to be in

red, e.g. being the same color as the index 58 of the valve 40.

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LEGAL STATUS [Date of request for examination] 20.04.2004

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 3949776

[Date of registration] 27.04.2007

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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## CLAIMS

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[Claim(s)]

[Claim 1] Two or more cylinder bodies which the fluid duct was connected, turned opening to the method of outside, and have been arranged at the control unit, It is the endoscope which has the piston object attached in each above-mentioned cylinder body free [ attachment and detachment ] in order to perform duct switch actuation. The above-mentioned piston object is removed from that in which the index which displays that it is a pair on the above-mentioned piston object and the above-mentioned cylinder body in which the piston object is attached was formed. In the brush insertion auxiliary implement of the endoscope which replaces with the above-mentioned piston object and is attached in one of the above-mentioned cylinder bodies in order to guide the brush for cleaning into the above-mentioned fluid duct The brush insertion auxiliary implement of the endoscope characterized by forming the index of the above-mentioned cylinder body in which the brush insertion auxiliary implement is attached, and the index which becomes a pair.

[Claim 2] The brush insertion auxiliary implement of the endoscope according to claim 1 with which a part or all of the above-mentioned brush insertion auxiliary implement has been the color index formed in the color and the same color of the index of the above-mentioned cylinder body that the brush insertion auxiliary implement is attached.

[Claim 3] The brush insertion auxiliary implement of the endoscope according to claim 1 or 2 which has the insertion section inserted in the above-mentioned cylinder inside of the body when the above-mentioned brush insertion auxiliary implement is attached in the above-mentioned cylinder body, and the positioning section located in the above-mentioned cylinder outside of the body in order to regulate the sense of the brush insertion auxiliary implement.

[Claim 4] The brush insertion auxiliary implement of the endoscope according to claim 3 with which at least one side of the above-mentioned insertion section and the above-mentioned positioning section is formed in the index color and the same color of the cylinder body in which the brush insertion auxiliary implement is attached.

[Claim 5] The brush insertion auxiliary implement of the endoscope according to claim 3 or 4 whose above-mentioned insertion section is a product made from plastics and whose above-mentioned positioning section is a product made of rubber.

[Claim 6] The brush insertion auxiliary implement of the endoscope according to claim 3, 4, or 5 with which the edge by which a pressure welding is carried out to a part for opening Motobe of the cylinder body which adjoins the cylinder body in which the brush insertion auxiliary implement is attached is formed in the above-mentioned positioning section.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the brush insertion auxiliary implement of the endoscope which removes a piston object from the cylinder body prepared in order to switch and operate the free passage condition of the fluid duct of an endoscope, and is attached in a cylinder body.

[0002]

[Description of the Prior Art] An endoscope does not have few in which fluid ducts, such as a supplied-air returning-water duct and a siphon way, are established. And the change-over actuation valve for switching and operating the free passage condition of a fluid duct is prepared in the control unit of an

endoscope.

[0003] Such a change-over actuation valve has the structure where the piston object was generally fitted in the cylinder inside of the body to which the fluid duct was connected free [ an attitude in the direction of an axis ]. And the free passage condition of a fluid duct is switched by stopping a piston object by actuation by the fingertip in two or more predetermined locations.

[0004] And in order to brush the inside of a fluid duct after endoscope use, a piston object can be removed from a cylinder body, it can replace with it, and the brush insertion auxiliary implement with which the guidance hole for guiding the brush for cleaning into a fluid duct was formed can be attached.

[0005]

[Problem(s) to be Solved by the Invention] However, generally a supplied-air returning-water change-over actuation valve and a suction actuation valve are located in a line with an endoscope, and are arranged, and if a piston object is removed from the both sides, opening will be carried out by two cylinder bodies together with the front face of a control unit.

[0006] Therefore, it may incorrect-equip with attaching in the cylinder-body side of a suction actuation valve the brush insertion auxiliary implement which should be attached in the cylinder inside of the body of a supplied-air returning-water change-over actuation valve, for example etc.

[0007] Then, this invention aims at offering the brush insertion auxiliary implement of the endoscope which mistakes a brush to the cylinder body in the condition that the piston object was removed, and can be attached that there is nothing.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the brush insertion auxiliary implement of the endoscope of this invention Two or more cylinder bodies which the fluid duct was connected, turned opening to the method of outside, and have been arranged at the control unit, It is the endoscope which has the piston object attached in each above-mentioned cylinder body free [ attachment and detachment ] in order to perform duct switch actuation. The above-mentioned piston object is removed from that in which the index which displays that it is a pair on the above-mentioned piston object and the above-mentioned cylinder body in which the piston object is attached was formed. In order to guide the brush for cleaning into the above-mentioned fluid duct, in the brush insertion auxiliary implement of the endoscope which replaces with the above-mentioned piston object and is attached in one of the above-mentioned cylinder bodies, it is characterized by forming the index of the above-mentioned cylinder body in which the brush insertion auxiliary implement is attached, and the index which becomes a pair.



[0009] In addition, a part or all of the above-mentioned brush insertion auxiliary implement may be the color index formed in the color and the same color of the index of the above-mentioned cylinder body that the brush insertion auxiliary implement is attached.

[0010] Moreover, the above-mentioned brush insertion auxiliary implement may have the insertion section inserted in the above-mentioned cylinder inside of the body when attached in the above-mentioned cylinder body, and the positioning section located in the above-mentioned cylinder outside of the body in order to regulate the sense of the brush insertion auxiliary implement.

[0011] And at least one side of the above-mentioned insertion section and the above-mentioned positioning section may be formed in the index color and the same color of a cylinder body in which the brush insertion auxiliary implement is attached, the above-mentioned insertion section may be a product made from plastics, and the above-mentioned positioning section may be a product made of rubber.

[0012] Moreover, the edge by which a pressure welding is carried out to a part for opening Motobe of the cylinder body which adjoins the cylinder body in which the brush insertion auxiliary implement is attached may be formed in the above-mentioned positioning section.

[0013]

[Embodiment of the Invention] The gestalt of operation of this invention is explained with reference to a drawing. Drawing 3 shows the endoscope and it is the control unit by which 1 was connected with the insertion section and 2 was connected with the end face of the insertion section 1.

[0014] Opening of the tip of the channel tube 3 inserted in covering the overall length in the insertion section 1 is carried out to the apical surface of the insertion section 1, and that has become the supplied-air returning-water suction opening 4. Free passage connection of the end face of the channel tube 3 is made at the supplied-air returning-water change-over actuation valve 20 and the suction actuation valve 40 which have been arranged at the control unit 2.

[0015] 21 and 22 are the cylinder bodies and manual operation buttons of the supplied-air returning-water change-over actuation valve 20. Moreover, 41 and 42 which were projected and prepared outside are the cylinder body and manual operation button of the suction actuation valve 40.

[0016] The air-supply tube 6 for supplying air and the water supply tube 7 for supplying water are connected to the cylinder body 21 of the supplied-air returning-water change-over actuation valve 20. Moreover, the suction tube 8 open for free passage is connected with the aspirator arranged outside at the cylinder body 41 of the suction actuation valve 40. 9 is a communication trunk arranged so that the flanks of both the cylinder bodies 21 and 41 may be

connected.

[0017] Drawing 4 expands and shows the parts of the supplied-air returning-water change-over actuation valve 20 and the suction actuation valve 40. It is respectively fixed to the control unit 2 with lock nuts 23 and 43, and the cylinder bodies 21 and 41 of the supplied-air returning-water change-over actuation valve 20 and the suction actuation valve 40 are arranged so that opening may be carried out to the outside surface of a control unit 2. 24 and 44 are the O rings for seals.

[0018] The annular colored indexes 38 and 58 which surround the heel of cylinder bodies 21 and 41 respectively are formed in the outer edge surface of both the lock nuts 23 and 43. The colored index 38 by the side of the supplied-air returning-water change-over actuation valve 20 is blue, for example, and the colored index 58 by the side of the suction actuation valve 40 is red.

[0019] The air-supply tube 6 and the water supply tube 7 open spacing, and are respectively connected to the side face of the cylinder body 21 of the supplied-air returning-water change-over actuation valve 20. The suction tube 8 is connected to the side face of the cylinder body 41 of the suction actuation valve 40.

[0020] Moreover, each pars basilaris ossis occipitalis of both the cylinder bodies 21 and 41 is open for free passage with the communicating tubes 10 and 11,

and free passage connection of the end face of the channel tube 3 is made at the end of the communicating tube 10.

[0021] Into the cylinder body 21 of the supplied-air returning-water change-over actuation valve 20, the piston object 26 is fitted in for the direction of an axis, enabling free sliding. Having projected the outer edge of the piston object 26 outside from opening of a cylinder body 21, the manual operation button 22 is attached there by screwing through mounting eye 22a.

[0022] Screwing connection is carried out, a manual operation button 22 is thrust into the mounting eye 22a by the edge of the piston object 26, and mounting eye 22a is attached in it.

[0023] 34 is a stopper for the piston object 26 to prevent slipping out of a cylinder body 21, and is stopped by the lock nut 23 free [ attachment and detachment ] with the really fabricated rubber covering 35.

[0024] The compression coil spring 36 is infixed between the manual operation button 22 and the stopper 34, and it is energized in the direction in which the piston object 26 projects from a cylinder body 21 by it. Mounting eye 22a which screwed in the piston object 26 and was attached has received the end of the compression coil spring 36.

[0025] In drawing 4 , the right-hand side half section of the supplied-air returning-water change-over actuation valve 20 shows the condition of being in

the 1st predetermined location extruded to the limit of the method of outside by the compression coil spring 36 until the piston object 26 collides with a stopper 34, and the left-hand side half section shows the condition of being in the 2nd predetermined location where the piston object 26 was pushed in to the limit in a cylinder body 21.

[0026] In the leak hole 32 formed in the core of the tip of a manual operation button 22, opening of the air hole 31 drilled in the axis location of the piston object 26 is carried out outside. The free passage hole 27 which is open for free passage to a communication trunk 9 in the standby condition shown in the right-hand side half section, and the free passage hole 25 which is open for free passage in the air-supply tube 6 are drilled by the air hole 31.

[0027] It is arranged at the part into which the colored barrel 37 formed of colored plastics material surrounds the leak hole 32, and the end face is visible to a manual operation button 22 from the method of outside. Pinching immobilization of the colored barrel 37 is carried out with mounting eye 22a and a manual operation button 22.

[0028] The color of the colored barrel 37 is the same blue as the color of the colored index 38 surrounding the end face of a cylinder body 21. Therefore, in case it attaches again after removing the piston object 26 from a cylinder body 21 and carrying out washing disinfection after endoscope use, adaptation

relation can be known, and incorrect wearing can be prevented.

[0029] In the crevice formed in the part of the free passage hole 27 which leads to a communication trunk 9, the check valve 28 which consists of elastic rubber material is arranged, and the flow of the fluid into the piston object 26 is prevented from the communication trunk 9 side.

[0030] The water flow hole 33 is drilled in the axis location, and opening is carried out to the pars-basilaris-ossis-occipitalis side of the piston object 26 on the base of the piston object 26. And as shown in the left-hand side half section, the water supply tube 7 and the free passage hole 29 open for free passage are drilled in the condition that the piston object 26 was pushed in to the limit in a cylinder body 21. Moreover, two or more wearing of O ring 30 for seals is carried out at the periphery section of the piston object 26 if needed.

[0031] Thus, in the standby condition which nothing operates, the air sent in from the air-supply tube 6 passes along an air hole 31, and the constituted supplied-air returning-water change-over actuation valve 20 is emitted to atmospheric air from the leak hole 32.

[0032] And if a fingertip closes the leak hole 32, the air sent in in the air hole 31 from the air-supply tube 6 will pass along a communication trunk 9, and will be sent out to the channel tube 3 through the inside of the cylinder body 41 of the suction actuation valve 40, and a supplied air will be performed from the

supplied-air returning-water suction opening 4.

[0033] And as shown in the left-hand side half section, after the fingertip has closed the leak hole 32, if a manual operation button 22 is pushed in to the limit, the water sent in from the water supply tube 7 will be sent out to the channel tube 3 through the water flow hole 33, and returning water will be performed from the supplied-air returning-water suction opening 4.

[0034] The piston object 46 is fitted in in the direction of an axis free [ an attitude ] also into the cylinder body 41 by the side of the suction actuation valve 40, and the same manual operation button 42 as the supplied-air returning-water change-over actuation valve 20 side, mounting eye 42a, the compression coil spring 56, a stopper 54, and the rubber covering 55 are attached, and it can detach in the head and attach freely to a cylinder body 41.

[0035] As the suction actuation valve 40 is shown in the right half part of a center line, the suction free passage hole 45 formed in the piston object 46 in the standby condition is closed by the internal surface of a cylinder body 41, and suction from the channel tube 3 is not performed. 48 is the sealant which surrounded the suction free passage hole 45 and was prepared.

[0036] And if a manual operation button 42 is pushed in as shown in the left half part of a center line, the suction tube 8 and the channel tube 3 will be open for free passage through the suction free passage hole 45, and suction will be

performed from the channel tube 3.

[0037] 49 is a guide pin which engages with the guide rail 47 formed in the direction of an axis at the wall section of a cylinder body 41, in order to make it the piston object 46 not rotate within a cylinder body 41.

[0038] The colored axis 57 formed in that medial-axis location of colored plastics material is arranged, and that end face is visible to the manual operation button 42 of this suction actuation valve 40 from the method of outside.

[0039] The color of the colored axis 57 is the same red as the color of the colored index 58 surrounding the end face of a cylinder body 41. Therefore, in case it attaches again after removing the piston object 46 from a cylinder body 41 and carrying out washing disinfection after endoscope use, adaptation relation can be known, and incorrect wearing can be prevented.

[0040] Drawing 1 removes the piston objects 26 and 46 from the cylinder bodies 21 and 41 of the supplied-air returning-water change-over actuation valve 20 and the suction actuation valve 40 after endoscope use, and shows the condition of having attached in the cylinder body 21 by the side of the supplied-air returning-water change-over actuation valve 20 the brush insertion auxiliary implement 60 for inserting the brush 100 for cleaning into the fluid duct connected to cylinder bodies 21 and 41. Drawing 2 is the top view.

[0041] The brush insertion auxiliary implement 60 is inserted in the cylinder body



21 of the supplied-air returning-water change-over actuation valve 20, it is for guiding the brush 100 for cleaning into a communication trunk 9, and combines in one the insertion section 61 made from plastics inserted in a cylinder body 21, and the positioning section 62 made of rubber located out of a cylinder body 21 in order to regulate the sense of the brush insertion auxiliary implement 60, and is constituted. 66 is a brush guidance hole for guiding the brush 100 for cleaning, is inserted in from the positioning section 62 and formed ranging over the section 61.

[0042] The relative movement of the direction of an axis is regulated by the 1st flange 63 and 2nd flange 64 which the insertion section 61 and the positioning section 62 opened and inserted in spacing, and protruded on the section 61, and relative rotation is regulated and united with notching formed in the insertion section 61 side, and there by the niting section 65 which consists of a part engaged from the positioning section 62 side.

[0043] And by making the positioning edge 67 formed in the positioning section 62 meet the periphery of the lock nut 43 of the suction actuation valve 40, the sense of the brush insertion auxiliary implement 60 to the cylinder body 21 of the supplied-air returning-water change-over actuation valve 20 is regulated, and the brush guidance hole 66 is set to the predetermined location which is open for free passage to a communication trunk 9 by inserting in, as shown in drawing 1

in the condition, and inserting the section 61 in a cylinder body 21.

[0044] In this condition, the pressure welding of the positioning edge 67 is carried out to the rim of a lock nut 43. Therefore, the brush insertion auxiliary implement 60 is fixed to a stable state by the resiliency of the positioning section 62 to a cylinder body 21.

[0045] Consequently, by inserting the brush 100 for cleaning from the brush guidance hole 66, the brush 100 for cleaning is guided into a communication trunk 9, and can carry out brushing cleaning of the inside of a communication trunk 9. And on the occasion of such actuation, the brush insertion auxiliary implement 60 does not separate simply from a cylinder body 21.

[0046] Thus, the insertion section 61 of the constituted brush insertion auxiliary implement 60 is formed by the blue plastics which is the colored index 38 and the same color of the supplied-air returning-water change-over actuation valve 20. Therefore, by checking the color, adaptation relation with the cylinder bodies 21 and 41 which should be attached is known, and there is no possibility of incorrect-equipping the suction actuation valve 40 side with the brush insertion auxiliary implement 60 for supplied-air returning-water change-over actuation valve 20.

[0047] Moreover, although illustration is not carried out, the brush insertion auxiliary implement for suction actuation valve 40 is formed in the red which is

the colored index 58 and the same color of the suction actuation valve 40, and there is no possibility of incorrect-equipping the supplied-air returning-water change-over actuation valve 20 side.

[0048] In addition, the fluid ducts to which the brush insertion auxiliary implement 60 of this invention is not limited to the gestalt of the above-mentioned implementation, and it is shown to the brush 100 for cleaning may be tubing other than communication trunk 9.

[0049] Moreover, both the insertion section 61, and positioning both [ one side or ] 62 may be made colored [ above ], or it may attach a colored index etc. independently. Moreover, an index may be displayed by patterns or lines other than a color etc.

[0050]

[Effect of the Invention] Since what is necessary is just to attach in the cylinder body the brush insertion auxiliary implement which has the index formed in the inlet-port part of the cylinder body of the duct switch operating set of an endoscope, and the index which becomes a pair according to this invention, the adaptation relation of the brush insertion auxiliary implement to a duct switch operating set becomes clear, and incorrect wearing can be prevented beforehand.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] The brush insertion auxiliary implement of the gestalt of operation of this invention is a side-face sectional view in the condition of having been attached in the cylinder body.

[Drawing 2] The brush insertion auxiliary implement of the gestalt of operation of this invention is a top view in the condition of having been attached in the cylinder body.

[Drawing 3] It is the whole endoscope schematic diagram of the gestalt of operation of this invention.

[Drawing 4] It is the side-face sectional view of the fluid duct switching unit of the gestalt of operation of this invention.

### [Description of Notations]

20 Supplied-Air Returning-Water Change-over Actuation Valve

21 Cylinder Body

22 Manual Operation Button

23 Lock Nut

37 Colored Barrel

38 Colored Index

40 Suction Actuation Valve

57 Colored Axis

58 Colored Index

60 Brush Insertion Auxiliary Implement

61 Insertion Section

62 Positioning Section

66 Brush Guidance Hole

67 Positioning Edge